

PALMER (A. B.)

QUININE

IN

ACUTE PNEUMONIA.

BY ALONZO B. PALMER, A. M., M. D.,

*Professor of Pathology and Practice of Medicine in the University of Michigan and the
Medical School of Maine.*

(REPRINTED FROM THE TRANSACTIONS OF THE AMERICAN MEDICAL ASSOCIATION).



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THE EFFECTS OF QUININE IN THE TREATMENT OF ACUTE PNEUMONIA.

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It has been wittily but too truthfully stated that "Science is the topography of ignorance," and that the "best part of our knowledge is that which teaches us where knowledge leaves off, and ignorance begins"—and in medical science particularly it is important to recognize the fact, that the line of demarcation between that which is truly and positively known, and that which is half known, or simply believed, is very often but illy defined. In no department of medical science is this confusion of boundaries between the known and the conjectural greater than in therapeutics; and if authority be taken as the guide, in no disease is the true course of treatment more uncertain than in pneumonia.

Acute peripneumonia, or, at least, acute inflammation of the covering and substance of the lungs, so frequent in its occurrence, and so marked in many of its features, has been recognized by all writers upon medicine, since the art has had a history. The earlier Greek and Roman writers attempted to make a distinction between pneumonia and pleurisy; but they succeeded very poorly in their attempt, and their successors confounded them together; and it is only in the comparatively recent time since Lænnec and his discovery of the principles of physical diagnosis, that it has been possible to clearly distinguish clinically between the two affections. Since this time, farther distinctions have been made of the different varieties of pneumonia, until at the present, standing at the beginning and not at the end of a full and true pathology of the disease, we recognize three forms of pneumonia, viz., croupous, catarrhal and interstitial. Without entering into the question of the perfectly distinct character of these forms, or the frequency with which they overlap or run into each other, I propose in this paper to confine my attention to the most common and most specific form of the disease—that which is now commonly designated as *acute, croupous, or lobar pneumonia*, and sometimes, and not improperly, as common *lung fever*.

I do not propose to enter into a discussion of the etiology, or any department of the pathology or symptomatology of the disease, any farther than may be necessary to throw some light, flickering and uncertain though it may be, upon the reasons for the treatment I shall recommend.

A careful study of the causes and peculiarities of pneumonia, especially as it occurs in an epidemic form, seems to establish its somewhat specific character—that it is not merely accidental in its occurrence, depending entirely upon exposure to cold, or to any of the common influences which produce the non-specific inflammations—those inflammations, I mean, having no definite or peculiar characters, and running no particular courses. It seems to be a peculiar form of inflammation, or a fever of a peculiar type, accompanied by an inflammation having a particular exudate of a tenacious or croupy consistence; the whole disease running or tending to run a somewhat definite course—having, like other specific and self-limiting diseases, its period of access, of development, of crisis, and of subsidence.

This somewhat specific and self-limiting character has caused many to come to the unwarranted conclusion, that its course cannot be interrupted, but that, as in the case of measles or small-pox, treatment can only be palliative, or such as will enable the patient to survive, while the disease runs its inevitable course.

The importance of every question connected with the treatment of pneumonia will be appreciated, when it is remembered that it comprises six and four-tenths per cent. of all internal diseases, and twelve and seven-tenths per cent. of the mortality from such diseases, not including in the statistics the cases of secondary pneumonia, or the remote consequences of the acute primary affection. These remote effects of the disease, when running its full course are often of the gravest consequence, and are frequently overlooked.

The subjects which attract most attention and occupy most time in the proceedings of medical societies, are not always those of most importance. Not unfrequently rare and even trivial affections, or some ingenious and showy, though comparatively useless, surgical or obstetrical contrivance or process will occupy more time and space than more important but unsettled questions, arising in the daily practice of the great body of the profession, and concerning the lives of immense numbers of the people.

The discrepancies and contradictions respecting the treatment of pneumonia in the past, must impair our confidence in mere opinions; and these contradictions by practitioners of equal experience and authority must forcibly remind us of the uncertainty of therapeutical science, and should caution us against too much positiveness in the expression of convictions. But this fact, instead of causing us to shun this subject, should induce us to meet it the more readily, and the more fully to compare views and experiences, and the more earnestly to seek for the truth, the deeper it is in the well—and every physician whose experience and observations have not been brief or limited, and who has clear convictions, should be encouraged to express them, and however they may differ from the opinions of others they should receive a respectful hearing from the profession. As I have some such

convictions on this important subject, I shall venture to state them, with the hope of eliciting expressions from others, if not their assent, and of thus aiding in the advancement of the truth.

In estimating the difficulties of determining the value of any course of treatment in pneumonia, the fact must be borne in mind, that a large proportion of cases, if left to themselves, will run a comparatively mild course, and terminate in recovery—often in a critical abatement of the fever and the active course of the disease in from five to ten days—and that also abortive cases sometimes occur where the termination is even at an earlier period.

Still a considerable proportion of cases do not terminate thus briefly and favorably, many patients succumbing during the violence of the disease, and still others having structural and vital changes produced, leading to more or less serious results. It is doubtful if a lung, which has undergone the process of hepatization, whether the method of the removal of that state has been by absorption or suppuration, is ever perfectly restored to its former condition of vitality and structure; and certainly it is only left enfeebled and degenerated, and more liable than before to destructive disease. In Vienna, where the “expectant” treatment has prevailed, the mortality from the immediate effects of the disease in seven thousand nine hundred and forty-two cases was twenty-four and five-tenths per cent., while those who suffered from more chronic impairment, and died from its secondary effects, it is impossible to know.

If there are any measures which will in even a small proportion of cases prevent these serious results that would otherwise follow, which measures at the same time will produce no counteracting injurious effects, they should be resorted to as a rule, though in a majority of cases they might be unnecessary.

I do not propose to discuss with any particularity the merits or demerits of the various methods of treating pneumonia, during the long history of medical practice, but will say, what all know, that none of them as *curative measures* have obtained the confidence of the profession in general.

There has been no lack of earnest and bitter discussion on the subject between the advocates of “heroic” measures on the one hand, and of “expectancy” on the other; while “heroic” practitioners have varied in the remedies employed from the combined use of blood-letting, mercury, antimony, and veratrum viride as “antiphlogistic” agents, to the falsely so-called “supporting” or “stimulating” practice of pouring down large quantities of alcohol.

There can be no doubt, that in modern times at least, the routine and vigorous antiphlogistic course, certainly if carried to the extent formerly recommended, is much worse than useless, especially among the class of patients illy fed and lodged, often debilitated by vices and poisoned with alcohol, and brought usu-

ally in advanced stages of the disease into large city hospitals. And it is also certain that some of the other methods when indiscriminately practiced are equally inapplicable and are generally useless if not injurious.

The more rational and conservative class of physicians, while doubting, perhaps denying, the great and general "change of type" of diseases alleged by some to have occurred in modern times, still recognize marked differences in this affection as occurring at different times and seasons, in different localities, and among people of different constitutions, and subjected to different hygienic influences; and, without confining themselves from theoretical notions to any very definite plan of treatment, vary their proceedings according to the indications they conceive to be presented in each particular case, sometimes endeavoring to abate excitement and fever, sometimes supporting the strength, and sometimes inducing elimination and absorption; and thus endeavoring to conduct each case to a favorable issue. This may be the general course which will ultimately prevail; but still all the cases of pneumonia, as it ordinarily occurs, have so many features in common that there must be some *best* plan for the treatment of the ordinary cases. For this best treatment we are all striving, and towards it, we are, it is to be hoped, approaching, though with various degrees of success.

For a long time past, as the result at first of casual experience, but later of more systematic observation and the study of the physiological and pathological experiments which have been made and the clinical experience of others, I have come to a mode of treatment of pneumonia quite different from that which as a student I was taught, and which for some years I pursued.

For more than twenty years I have taught (and verified the correctness of the teaching in practice) that if a patient with the ordinary acute forms of pneumonia be seen within a few hours after the attack, and a free dose of an opiate be given, and once or twice repeated, so that its full anodyne, sedative, and medicinally narcotic effect is produced, and for some hours maintained, in a large majority of cases, the fever and inflammation would be subdued, and the course of the disease arrested; the pathological state not passing beyond the stage of hyperæmia, or that of inflammatory engorgement.

After the effect of the narcotic has subsided, a mild cathartic (usually a few grains of blue mass, followed by a saline laxative) was given, and this, followed by some gentle eliminatives, as the acetate of potassa, or the iodide of potassium, would complete the case. Before material structural changes have occurred, and before exudations have been poured out, seriously obstructing respiration, the opiate is comparatively, if not absolutely, safe. No seriously unpleasant effects have in a single instance been noticed by me from such early use; but at a later period, when extensive hepatisation has occurred, or the bronchial tubes are

much obstructed with the tenacious exudate, a free opiate may increase dangerously the existing apnœa. My teaching farther has been, that if this treatment, applied early, should fail to arrest the disease, or the patient was seen too late to render its adoption safe, then the ordinary methods were to be pursued—a bleeding, possibly at an early stage in a plethoric subject, especially if much dyspnœa, not arising from obstructed bronchi, or if congestion of the brain was present, the diminishing of the blood removing pressure, and giving relief, though seldom arresting the inflammation. But in this teaching it was urged, that if hepatization had occurred a large quantity of the solid constituents of the blood were removed from the circulation, and fixed in the lung, and that farther loss by the lancet could be illy borne, and that then supporting measures, good food and tonic medicines would often be demanded.

This general plan being more successful than any previously observed was fairly satisfactory; but patients under it would occasionally die, and not a few from the disease running its full course would be left with impaired lungs, having protracted and unsatisfactory recoveries.

But in 1865 my attention was called, by a practitioner of much experience in diseases of his locality, to the great efficiency of *quinine* in pneumonia. He most positively asserted its *abortive* effects in the disease. The fact, for many years before had been familiar to me, that when full antiperiodic doses of this wonderful medicine had been given in marsh malarial fevers complicated with pneumonia (a combination I had very often witnessed) the pneumonia as well as the fever would be speedily arrested.

I had supposed, however, that this form of pneumonia was dependent upon the malarial fever, or was in some way peculiar in its character, as intimated by M. Bailly, Lænnec and others; but I was assured by my friend, and soon proved for myself, that pneumonia, not connected with malarial fever, was similarly influenced by the quinine.

The efficacy of bark and quinine in some forms of pneumonia and other visceral inflammation, especially as connected with malarial fever, has been recognized for a long time. Lænnec refers to a "Treatise on Simple and Pernicious Intermittent Fevers" by M. Bailly, published in Paris in the year 1825, in which it is stated that in the pernicious fevers of Rome there is an "absolute necessity of administering the bark, in order to check the progress of the fever, even in cases complicated with the greatest visceral inflammation;" and the works of Morton, Torti, Quarin and others are referred to as presenting the same views. Lænnec himself speaks of cases of pneumonia and other inflammations which were treated by "bleedings too frequently repeated, and by cinchona given in too small doses, and left off too soon."

He again says, "We sometimes even meet with epidemic peri-

pneumonias in which blood-letting is constantly hurtful, and the *bark* beneficial in every stage of the disease. This fact, which cannot be denied, was frequently witnessed in Germany towards the close of the last century. Numerous examples of the same kind are recorded in the old *Journal of Medicine*; and I have myself met with many, particularly in the epidemic among the troops in 1814, already mentioned. . . . To be effectual it must be given to the extent of an ounce of the powder or an equivalent portion of the extract daily. In several cases I have continued to give the *sulphate of quinine* for more than a month, to the extent of eighteen grains in the twenty-four hours." He adds, that "opium has sometimes been employed with success in the same circumstances as the bark."*

Among the more recent authorities Dr. Wilson Fox, in his article on pneumonia, in *Reynolds's System of Medicine*, says "pneumonia complicated with intermittent fever requires the use of quinine. Huss recommends that eight grains should be given during the rigor, and repeated in the sweating stage," Volume V, page 707.

Dr. Fox also, in speaking of a form of intermittent pneumonia, remarks: "It is said that quinine, if given early, *will cut the disease short*; but if this is not effected, the pneumonia tends to become double, and of a dangerous character." He refers to Morehead on Diseases of India, and the other works as quoted by Griscolle. Reynolds, Volume V, page 661.

Niemeyer speaks of "the bold administration of quinine and iron" as peculiarly appropriate in some cases of pneumonia, required from the "very outset of the attack;" and he classes quinine with veratrine and the inhalation of chloroform as febrifuge agents in the active forms of the disease. "By these agents," he says, "the action of the heart and the temperature can be reduced, and the fever moderated, but they have no immediate local influence upon the nutritive disorder." Dr. Fox, however, in speaking of veratria, says, "in some it appears to accelerate the period of the crisis, and Kocher is of opinion that it also shortens the duration of the process of resolution; while in a few cases, when given early, it appeared to *cut short* the disease, and to prevent the occurrence of consolidation." It is this latter effect which I now claim for quinine.

Dr. F. T. Roberts, in his *Theory and Practice of Medicine*, says "if there be high pyrexia in pneumonia, full doses of quinine may be tried." And Dr. J. S. Bristowe in his recent work, speaking of the same subject, says that with the object of reducing the temperature the "cold bath, quinine in large doses, veratria, digitalis and aconite" may be used.

The views of the writers of this country in our standard

* Lænnec on Diseases of the Chest, etc., translated by John Forbes, M. D., London, 1827, page 243, et seq.

works and medical periodicals are too well known to need quotation. The experience in the army, during our late war, has modified professional opinions on various important subjects, and on none, perhaps, more than on the therapeutical effects of quinine.

The influence of Peruvian bark and its derivative in diminishing directly the phenomena of fever—as an antipyretic—though by no means a recent discovery, has been more prominently brought before the minds of the profession of late by the writings of the German physicians, and particularly by those of Liebermeister and Juergensen in *Ziemssen's Cyclopadia*. I need not detail their views, since by the enterprise of the American publishers a translation of this great work has been placed within the reach of the masses of the profession; but the views and experience of Juergensen upon pneumonia and its treatment with quinine are so forcibly expressed and so striking in their operations as to challenge somewhat particular attention. As is well known, he holds that croupous pneumonia, though not contagious, is a general and specific disease, or, as he expresses it, “is a constitutional disease, and is not dependent upon a local cause. The pulmonary inflammation is merely the chief symptom, and the morbid phenomena are not due to the local affection.” He contends that it belongs to the “group of infectious diseases”—that it cannot be produced by any of the usual causes of inflammation, that there is no constant relation between the local and febrile symptoms, that it runs a typical course, and that, as in other diseases depending upon a special exciting cause, as typhoid fever, or the exanthemata that “nature cures, the only duty of the physician is to maintain life until the cure is effected.” He declares in emphasized types, that “this is the principle which underlies the management of all acute infectious diseases, and is applicable here unconditionally.” He farther teaches that in “croupous pneumonia the danger threatens principally the heart of the patient”—that “death results from insufficiency of the heart”—and that “the fever is the chief cause of the heart's failure.” “The fever,” he adds, “induces increased labor on the part of the heart, and at the same time inflicts a direct injury upon it,” produces feebleness and degeneration of this organ—and consequently “the fever is the first point of attack for treatment.” He regards as the proper means for subduing the fever, the application of cold by means of the bath, but more particularly the use of large doses of quinine. This article, he declares, unlike nearly all other antipyretic remedies, “reduces the fever without enfeebling the heart.”

I regard most of these positions as well taken and correct; and his statistics showing the success of his mode of treatment compared with other plans mentioned are very striking, if not conclusive, as to its superiority over them. But my experience compels me to take issue with the doctrine, that croupous pneumonia must run its course—that it cannot be interrupted—and

that the *only* duty of the physician is to maintain life until that course is completed.

On the contrary, as already intimated, I cannot doubt that quinine is capable, when properly used, certainly in the early stage of the disease, of arresting its progress in a large majority of cases, not only mitigating the fever, but preventing the full development of the local inflammation.

This conclusion is based upon my own personal experience—upon observations carefully made; and these have continued through so long a period, and involved such a number of cases where the diagnosis was unmistakable, as to exclude the possibility of doubt. I am gratified, too, in being able to say that many who have resorted to this practice have reported to me similar results.

It may very naturally be thought that after Juergensen's extensive use of quinine, his statement that pneumonia cannot be interrupted in its course is very strong testimony against the abortive effect of *this* article at least. And so at first view it seems to be. But, as is the case with nearly or quite all the Europeans who write our books, his practice, upon which his facts and his statistics are based, has been in the hospital of a large city: while such private practice as he may have had has been in consultation. In such practice one very seldom sees pneumonia in its early stages.

In a large European hospital, patients with medical diseases are almost never seen by the attending physician of the hospital until the disease, if it be acute, has made decided advancement. There is first a delay on the part of the poor patient or his friends in calling for aid. The first physician called usually undertakes the case, but discovering its serious character, advises the removal to a hospital. An official, or some authorized person, is then called upon, delays occurring at every step, and thus some days usually pass before the patient is actually in his bed in the ward, and still further time elapses before the physician at his regular days or hours of attendance arrives at the bedside of the sufferer.

In consultation practice, the consultant is very seldom called upon until the case is not only serious, but, if acute, advanced: and in pneumonia, after hepatization or suppuration has occurred, or any material structural changes have taken place, more or less *time* will be required for the removal of morbid processes and their effects.

Moreover, with the belief that the disease cannot be arrested, and that the treatment is only to be resorted to for palliative purposes, and only when the severity of the fever threatens the exhaustion of the heart, the quinine would not be likely to be immediately given, even if the patient was seen in the very early stage, and it is then alone that a speedy and complete arrest can be expected. It may be presumed, then, that Juergensen has not

tested, certainly on a large scale and under favorable circumstances, the treatment I shall soon more particularly describe.

The unsoundness of the position, that because pneumonia is regarded as a specific "malarious" or infectious disease, therefore it cannot be arrested, will be evident by calling to mind the single fact, that the common malarial or paludal fever is universally acknowledged an infectious disease—one depending upon a peculiar poison and having a specific type—but that it is more under the control of abortive remedies than any other general disease whatever. One of the diseases with which Juergensen would especially like to have pneumonia classed, is acute articular rheumatism: and all who have had experience with the proper full doses of salicylic acid, or salicine with the addition of alkalis, in this disease, well know that "flannel and six weeks" is not the most efficient remedy for this specific affliction. Juergensen himself tells us that there are spontaneously abortive cases of pneumonia; and if some cases, even violent in their onset, the chill being decided and the temperature running as high as 105.8° Fahrenheit and above, may be "immediately succeeded by a rapid defervescence, so that the normal temperature be reached by the second or third day," is it not probable, or at least, possible, that medical treatment may produce a similar result in other cases?

This is a matter to be determined by *experience*, and not by *à priori* or analogical reasoning. And certainly no analogical reasoning can settle this question when a large part of the analogous cases are entirely ignored. Indeed, one of the great hopes for the medicine of the future is in the discovery of antidotal remedies, which by destroying specific poisons shall arrest specific diseases.

Pneumonic fever is not of an obstinate type. This is distinctly stated by Juergensen himself. There are several articles of the materia medica which, when properly used under favorable circumstances, have the power of arresting this fever. They are agents which make a strong impression on the *organic nervous centres, the morbid conditions and actions of which are now, with the greatest reason, believed to be the more immediate cause of the pyrexial state*. Opium in free doses, as I have already stated, will often arrest the fever. Many believe that veratrum viride, or aconite, or alcohol in free narcotic doses, will have that effect. All these agents, and others under certain circumstances at least, are capable of markedly diminishing feverish temperature and the associated morbid actions; but most of them are apt to depress the heart's action to such an extent, when given in full antipyretic doses, as to render them dangerous by inducing collapse. But quinine reduces fever without in the same way depressing the heart's action.

But quinine does not only reduce the fever, which is an essential element in inflammation, but it has a special tendency to

relieve internal congestions; it brings the blood more freely to the surface, and induces perspiration; and if we can rely on modern experimental observations, *it diminishes the production and the amœboid movements of leucocytes*, and thus diminishes exudation—another important element of the inflammatory process.

If fever and the other inflammatory elements depend upon the wrong action of the nervous system, as many of them certainly do, we would naturally look to neurotic agents to modify and control them. The term “antiphlogistic,” indicating opposition to inflammation and feverish excitement, long meant bleeding, purging, antimony, mercury, and salines. To my mind this term now means rather *opium, quinine, salicine, veratrum viride, aconite, and other neurotics*—articles capable of acting powerfully upon the nervous system, and through it upon the febrile and inflammatory processes.

In the treatment of pneumonia by quinine, as in the treatment of every other disease by active remedies, everything depends upon the dose, the time, and other circumstances of its administration. Juergensen's method is to use it in connection with the cool or cold bath, the quinine aiding the bath in the reduction of the temperature. He says: “In addition to the direct abstraction of heat, I always use quinine. Above all other antipyretic medicines it possesses the invaluable advantage of reducing temperature without injury to the heart, and this is accomplished by diminishing the production of heat. The dose he advises is from twenty-five to forty-five or more grains, given at once or within a few minutes. This reduces the temperature in a short time, and keeps it reduced for from twelve to forty-eight hours; its greatest reduction (from 2.7° to 4.5° Fahrenheit) occurring in from five to seven hours after the dose is taken. He advises that the dose be not repeated until the temperature again rises, and generally not before forty-eight hours. He recommends at the same time nourishing food, and, when the bath is used, “light wine.” He adds: “There is no doubt that alcoholic drinks *lower* rather than *elevate* the temperature, and it is more than probable that the alcohol acts as a direct preservative of the tissues. The former prejudice, which is still prevalent, has been shown by Bouvier and Binz to be unfounded.” The alcohol is given, then, to aid the quinine in *reducing the temperature*, and for the purpose of arresting too rapid destructive metamorphosis of tissues.

He strongly advises the use of morphine or chloral hydrate as may be required to relieve pain and procure sleep, not seeming to fear the depressing influence of these articles on respiration; and when the heart's action actually fails, he resorts to musk and camphor in addition to the other means.

This method of Juergensen, now so well known to the profes-

sion, I have thus briefly introduced in order to compare it with the one which I venture to present.

The particular method in the treatment of common pneumonia, which for several years past I have pursued with such results as to induce me to strongly recommend it to others, is briefly as follows:—

When called to a patient within twelve or twenty-four hours after the chill, or at any time before any considerable exudate has occurred, I immediately give from six to ten grains of quinine together with from one-fourth to one-third of a grain of morphine, which almost invariably, in a short time—from half an hour to two hours—induces free perspiration and a reduction of the temperature. I then repeat the *quinine* in doses of from four to eight grains once in from two to three hours, and unless all pain and special uneasiness are relieved I add another, but usually smaller, dose of morphine in four or six hours; but by all means continuing the quinine in one of the last mentioned doses, until from thirty to fifty and sometimes sixty grains are given. Sometimes from twenty to twenty-five grains will be sufficient, given in these divided doses; or, if preferred, as it is by some, in doses somewhat smaller, but more frequently repeated. But as the larger quantity is innocent and may be needed, I prefer to give at least thirty and oftener as much as forty grains in from twelve to twenty-four hours. The effects desired, and certainly as a rule produced, are a decided reduction of temperature, a marked diminution in the frequency of the pulse, a decided moisture of the skin or free sweating, a slower and more easy respiration, or relief from pain and the feeling of fullness in the chest, a diminution of the cough and of the tenacious and bloody character of the expectoration; and in short not only is there a checking of the fever, but of all the evidences, general and local, of the pulmonary engorgement and inflammation; and the quantity of the medicine to be given will depend much upon the completeness of these effects produced.

The slight deafness and ringing in the ears, which may or may not result from these doses, is a matter of very little consequence, is almost always quite temporary, and *should have no influence in determining the quantity to be given*. A small quantity of quinine will produce these phenomena with some, while large doses will fail to do so with others, and neither in pneumonia or ague *are they the measure of the medicinal effect of the remedy, or an index of the quantity that will be required or borne*.

As a rule, all the treatment required after this will be a gentle laxative, or, if the tongue be much coated, a few grains of blue mass, followed in a few hours by a mild saline cathartic, and this, in turn, followed by some mild eliminative mixture.

There may be cases, however, early undertaken, that will resist this treatment, but in those occurring under my observation

the results as indicated have followed, with scarcely a single well-marked exception, whenever the plan has been fairly and thoroughly carried out. The cases have been virtually *aborted*—convalescence speedily occurring, and nothing more than a moderate congestion of the lung remaining, and this only for a few days.

If the treatment be commenced much later, and especially after hepatization has occurred and the dyspnœa is marked, the morphine must be omitted, or given with more caution, but *the quinine is to be given in the same way*; the result very generally being to *bring down the temperature and check the extension of the disease*; but of course not so speedily to remove all its consequences. If much structural change has occurred, time will be required, and the continuance of more or less pathological action, before the lung is restored to its normal state.

In my judgment, at whatever stage of the disease a patient is seen, the quinine in these free doses should be given and the full physiological effect as described should be obtained—the disease by such treatment being favorably modified, if not arrested in its progress.

The comparative effects in these advanced stages, of Juergensen's method and that I have followed, I am not able to state.

Having commenced the treatment with quinine some years before knowing of Juergensen's method, and having been satisfied with the results, I have not tried the plan of that distinguished author. That the subsequent course of the disease is usually materially shortened and rendered milder and less dangerous by the quinine treatment, at whatever stage of the disease it is begun, is as clear to me as that it is often aborted by this remedy when given early.

But if the treatment with quinine fail to produce all the results which have been described, it is, so far as careful observation for many years, and in a large number of cases, enables me to judge, a *harmless* agent, and all the other means which our art affords can be made available to conduct the case to a favorable termination.

These other means it is not the object of this paper to detail or discuss. It would be easy to introduce illustrative cases, but this paper, already extended beyond the limits I have intended, would be thus made too long. My object has been to present some of the claims of quinine as an antiphlogistic agent, more especially in the treatment of pneumonia.

